Lighting Africa, a joint IFC and World Bank program, seeks to accelerate the development of commercial off-grid lighting markets in Sub-Saharan Africa as part of the World Bank Group's wider efforts to improve access to energy. Lighting Africa is helping mobilize the private sector to build sustainable markets to provide 2.5 million people with safe, affordable, and modern off-grid lighting by 2012. Lighting Africa is implemented in partnership with the Africa Renewable Energy and Access Grants Program (AFREA), the Asia Sustainable and Alternative Energy Program (ASTAE), the Energy Sector Management Assistance Program (ESMAP), the Global Environment Facility (GEF), the Good Energies Inc., Italy, Luxembourg, the Netherlands, Norway, the Public-Private Infrastructure Advisory Facility, (PPIAF), the Renewable Energy and Energy Efficiency Partnership (REEEP) and the United States.

For more information: www.lightingafrica.org, follow us on Twitter and Facebook.

Lighting Africa Newsletter – Issue No. 18, February 2011

The Lighting Africa newsletter is a briefing on the latest developments in the program and the off-grid lighting market. It is provided to all member organizations and individuals in the Lighting Africa network. Help us help you tell your story by sending us your articles. Lighting Africa does not endorse the contents of the articles submitted by its members. For comments, questions, or suggestions, please contact our project team at support@lightingafrica.org.

New website: **Register!** To get access to cutting-edge market trend analysis, market reports, quality assurance information, and other materials free of charge, take a moment to re-create an account on Lighting Africa's new website.

In Focus: Accelerating the Market for Solar Lighting in Africa

The African market for off-grid lighting products is taking off.[1] The market is projected to achieve 40 percent to 50 percent annual sales growth, with 5-6 million African households owning quality portable lights (primarily solar) by 2015.[2]

Lighting Africa contributed to this market acceleration: in 2010 alone, the sales of solar portable lanterns that have passed Lighting Africa's quality tests grew by 70% in Africa. This resulted in more than 672,000 people on the continent with cleaner, safer, reliable lighting and improved energy access.

The state of the market

The market for off-grid lighting was initially supported by donor-led initiatives, and was characterized by high unit costs and technologically inadequate products that were not suited to the needs of African consumers. Today, the market is driven by private sector interests: innovative business models, unique marketing strategies, and products tailored to meet consumer demand hold sway.

[1] Solar Lighting for the Base of the Pyramid – Overview of an Emerging Market, a Lighting Africa publication, 2010.
[2] This excludes poor-quality battery-powered LED torches (many in the $1 to $10 range), sales of which are in the millions.

All players along the value chain have contributed to this transformation.

Manufacturers and distributors have started to design and distribute better-quality products, with lamps that cater to the preferences of people at the base of the pyramid. These products have a longer battery life and provide better illumination. While there are many substandard products in the African market, the number of quality products is increasing. Lighting Africa has contributed to this development by designing a quality assurance program that allows manufacturers, distributors and other bulk buyers to test and improve the quality and design of their lighting products. Eight products have so far passed these quality tests and become Lighting Africa Associates. They are available in the African market, retailing between $22 and $97.

Consumers have benefited from better-quality products that suit their needs. The new-generation lamps offer features that consumers are demanding, such as cell phone chargers. The prices of light-emitting diodes (LEDs), solar components, and batteries have also fallen sharply over the five past years. As a result, off-grid products are more affordable to low-income households. Consumers are also learning to distinguish between quality and substandard solar lamps. For example, Lighting Africa's consumer education campaign has reached more than 9 million Kenyans living in rural areas, raising their awareness of the benefits of solar lighting over fuel-based lighting, and helping to make them informed buyers.

For African consumers, the main obstacle to making the switch to clean, off-grid solar lighting is the up-front cost of solar portable lanterns. Kerosene may be expensive, hazardous, damaging to one's health and a pollutant, but it has the advantage of being sold in small portions. A rural, off-grid household in Kenya will typically spend between 20 Kenyan shillings (about $0.25) and 50 Kenyan shillings a day on kerosene – but would struggle to find the 2,000 Kenyan shillings ($24.60) required to purchase a quality solar portable lantern. Several organizations have started to tackle this cash-flow issue. In several African countries, distributors of solar portable lamps are partnering with savings and credit cooperative societies to provide loans to consumers who wish to purchase a solar portable lamp. This is the case of "Developing a Delivery Model to Support Consumer Financing Schemes for Solar Powered Lighting Systems". The project, implemented in Kenya from November 2008 to June 2010, was a winner of the Lighting Africa Development Marketplace Competition which provides seed funding for innovation in off-grid lighting product development. Other Development Marketplace winners such as the project "Recharging Fees For Lamps Can Buy hours of Solar Light" in Uganda allow consumers to rent a lamp, building consumer confidence in these products over the longer term.

African governments are looking at clean, off-grid lighting as an interim measure for rural communities not yet connected to power grids. While there is no substitute for grid electrification, clean, off-grid lighting products can offer an interim solution for communities without access to power and provide immediate benefits. A number of African governments have taken this route to complement their plans for rural electrification. For example, Lighting Africa has signed memoranda of understanding with the governments of Mali, Senegal, and Ethiopia to support their work in increasing access to lightning for rural populations.

Microfinance institutions and banks are starting to see the potential of the clean, off-grid lighting market in Africa. Until recently, this was considered a high-risk market, but this perception is changing rapidly. By 2015, some 65 million in Africa could have portable solar lighting. Access to finance – for distributors in the area of trade finance as well as consumers with limited cash flow – is the single major obstacle to scaling up the market. Financial institutions may be unfamiliar with portable solar lighting and wary of the impact of low-quality products on their investments. Lighting Africa is working with banks to develop a risk-sharing facility for distributors. Over the past six months, Faulu, a leading Kenyan microfinance institution working with Lighting Africa, has begun to provide loans to rural households to buy solar portable lanterns.

Lighting Africa has been a key driver in transforming the off-grid lighting market in Sub-Saharan Africa, working as a neutral broker of industry interests and supporting the growth of innovative companies along the supply chain. This is a contribution to the global market for affordable, modern, off-grid lighting, which has the potential to dramatically improve the lives of hundreds of millions of people around the world.

Lighting Africa News

University of Nairobi launches low-cost testing center for solar lamps

Importers and distributors in East Africa now have a platform to test the quality of solar portable lanterns before they reach the market. In February, the University of Nairobi opened a laboratory conducting tests on a commercial basis, using Lighting Africa's initial screening method.

This is the first laboratory of its kind in East Africa. Local manufacturers and distributors of lighting products in Kenya and the broader region, as well as government agencies and nongovernmental organizations, can bring in their lamps for a quick screening to determine product quality.

Establishing the quality grade is of the utmost importance. Over the past five years, a profusion of substandard solar lanterns has eroded consumer confidence in solar technology. Consumers have fallen victim to overblown claims about the utility of solar torches, task lamps, room lamps and the like, only to realize that these products did not live up to expectations. Lighting Africa's screening method allows for quick identification of promising products. Importers will now have an affordable way to test products before purchasing and bringing them into the country.

By mid-February of this year, the Nairobi laboratory had already tested 21 products for system level performance, component performance, durability, and manufacturing quality.

With a turnaround of four to six weeks, and a cost of about $500, Lighting Africa's initial screening is faster and cheaper than other methods. Products that pass the initial screening also become members of Lighting Africa, benefiting from a range of business support services, such as advice on product design and access to Lighting Africa's full-fledged quality test method at half price ($3,000 for members compared with $6,000 for non members). In recent months, Lighting Africa's quality assurance team has worked with the staff at the University of Nairobi laboratory to build capacity in battery, photovoltaic and photometric testing; electronics durability and quality assessment; and interpretation of test results to maintain high standards.

Lighting Africa is working to establish a low-cost local testing center in Dakar, Senegal, which will also make use of the initial screening method. Internationally, three laboratories in China, Germany, and the United States are accredited to conduct the more extensive quality test method.

Lighting Africa is working with the industry to develop a quality seal that will provide a global benchmark and performance assurance for consumers. The seal is expected to be ready by the end of this year.

New website: Register!

Lighting Africa has a new website: www.lightingafrica.org. The website was upgraded to meet the needs of the key partners in the off-grid lighting market – manufacturers and distributors, consumers, financial institutions, governments, and donors.

With an average of 48,000 hits a month and 2,400 registered members, Lighting Africa's website has become a key reference point for Africa's emerging, low–cost, off-grid lighting sector over the past two years.

The upgrade is intended to allow for a more targeted approach and outreach in response to market requirements. The new website will provide market trend reports, research findings, insights into product development, and quality assurance materials.

Various free downloads will also be available. To access more in-depth resources, and to receive regular materials and updates from the off-grid lighting sector, you will need to register on the website – even if you already had a Lighting Africa account on the previous website.

Associate News

New solar lamp passes Lighting Africa quality tests

The SunTransfer 1, an LED lamp from SunTransfer, has just passed Lighting Africa quality tests for system level performance, component performance, durability, and manufacturing quality. The SunTransfer 1 can be used as a torch or fixed to the ceiling, and features an optional cell phone charger.

The SunTransfer 1 is the eighth solar portable lantern that has passed Lighting Africa's quality tests, and become an Associate.

See our list of Associates and find out how to become one.

Off-Grid Lighting Sector News

CDM rewards high-quality off-grid lighting products

By Evan Mills, Ph.D.
Lawrence Berkeley National Laboratory

Few project developers have bothered to qualify their LED lighting programs for carbon credits under the Clean Development Mechanism (CDM). The requirements have been too onerous for companies, while in the eyes of researchers they have failed to address many important realities about LED lighting.

Informed by a Lumina Project study conducted for the CDM Executive Board, the CDM recently released a new approved methodology for small-scale CDM project activities: Substituting fossil fuel based lighting with LED lighting systems.

The guidance from Lumina, and incorporated by the CDM, was to provide a method better suited to LED projects. The method would also need to trim the time and cost of qualifying a project and documenting the carbon savings; require performance disclosure and embed new criteria for minimum product quality; and reward products that exceed these minimums. In most cases, independent testing is required to demonstrate performance.

The key shift from the old method is to allow for baseline assumptions about kerosene use, and shift the focus to the type and performance of the LED replacement. The method requires disclosure of various LED system performance parameters (such as lamp wattage, lamp-rated lifetime, charging system capacity, type of charge controller, type of battery, operating time per full battery charge, charging time, indicators of ruggedness). It also accommodates grid-charging scenarios and requires a minimum one-year warranty.

The method requires embedded LED lamps to have a manufacturer-certified minimum lifetime of 5,000 hours, including lumen depreciation of no more than 30 percent. It also requires manufacturer-certified battery charging efficiency of 50 percent or more, minimum illuminance levels of 20 lux for task lighting and 4 lux for ambient lighting. It requires a renewable charging system and battery size to be properly matched. Batteries must be rechargeable and replaceable, and availability of replacement batteries documented. Also, in the spirit of requiring and rewarding product quality, the method requires dust and water tightness of IP41 per standard IEC 60529. It is expected that these assumptions will be more fully harmonized with Lighting Africa performance criteria.

The new method is a testament to work that has been done previously by Lighting Africa. The program's market research helped to support assumptions about off-grid lighting usage. Crucially, requirements for demonstrating product quality are indexed to Lighting Africa's protocols.[3] This is reinforced through a default product lifetime of only two years. If manufacturers can document that they have more durable products, then the lifetime can be extended up to seven years. This approach avoids giving excessive (unjustified) carbon credits to low-quality products, while rewarding manufacturers who produce better products.

Based on the minimum performance criteria specified in the new approved methodology, the deemed savings would be 0.16 tons of carbon dioxide per lamp (over a two-year deemed service life), worth $3/lamp at today's carbon prices. Alternate values for many factors can be used if adequately justified by the project developer, which could significantly raise the level of emissions avoided.

The CDM routinely updates these methodologies and welcomes input from manufacturers and other interested parties on how to improve the method.

[3] The Lighting Africa Quality Test Method. Read more here.

Partnering to bring clean solar lighting to women in Kenya

GVEP International (the Global Village Energy Partnership) and the Women's Enterprise Development Institute (WEDI) recently joined forces to promote portable solar lights in Kenya. Within six months, (September-March 2010), WEDI, a fund manager working with over 800 women's savings and credit groups had sold 400 d.light NovaS250 solar lanterns. These lights will provide about 2,000 people with a clean, safe alternative to kerosene lamps – with the added benefit of charging their cell phones from these lamps.

d.light is committed to supplying quality products, and to replacing any faulty devices. The company's d.light NovaS250 has passed Lighting Africa quality tests. WEDI made loans in three installments to the women who wished to purchase lamps, and GVEP International provided a loan guarantee scheme.

Read the full story

Resources

How to read an LED datasheet

Lighting Africa has published a Briefing Note entitled Specifying LEDs: How to read an LED datasheet. This technical brief discusses information found on an LED datasheet and is intended to give engineers, system designers, and manufacturers assistance in reviewing LED packages, and in deciding which products to purchase.

Choosing the right LED is the first step in designing a high-quality LED light. This decision starts with a review of the information provided by the LED manufacturer on a datasheet. Knowing what to look for on this datasheet, and how to interpret the numbers, is very important in assessing how well a particular LED will work for a given product.

The note explains the contents of a typical LED datasheet. Absolute maximum ratings, output characteristics, product codes, and binning parameters – and their relationship to product performance – are discussed. Samples are included to show how this information is organized and conveyed.

These publications are intended as guides for practitioners in the off-grid lighting sector. This is the third such note. See also Briefing Notes Issue 1 on *LED Lighting Basics*, and Briefing Notes Issue 2 on *LED Lumen Depreciation and Lifetime*.

Poor people's energy outlook 2010

Practical Action, a development charity with headquarters in the United Kingdom, has just published a report entitled *Poor People's Energy Outlook 2010*. The report presents direct testimonies of people living without adequate access to energy, and advances a series of new energy service standards in response. Practitioners present their perspectives on the big challenges. The report proposes a new framework for action, recognizing the range of actors needed to eliminate energy poverty, and urges a policy focus to create an energy access "ecosystem" in which these players can work effectively and flourish. The analysis provides insight into the ways people use energy, the constraints on expansion of access to energy, and the indicators that can be used to measure progress.

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